A NOVEL APPROACH USING DATA MINING ON PREDICTING WALK-IN MALLS

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ABSTRACT:
"The term Knowledge Discovery in Databases or kdd refers to the broad process of finding knowledge in data, and emphasizes the "high-level" application of particular data mining methods. The unifying goal of the KDD process is to extract knowledge from data in the context of large databases." This paper explores about the human foreboding (thoughts or feeling) and the tradition of shopping in a mall & how a shopping mall is a wonderful centre of entertainment nowadays. The research integrates and manipulates why people are into the shopping malls and the feasibility of the shopping malls into the decision tree model, for a transformation of Homo sapiens (modern humans belong) in shopping malls. The paper uses a set of data for verification. Moreover, classification of data mining and predictive analysis is employed to mine the data. This research gives knowledge in a consumer's utilization based perspective about shopping in malls.

KEYWORDS: *KDD, shopping malls, data mining, Descriptive task, Regression Analysis, prediction, decision tree.*

I. INTRODUCTION

Shopping malls are an emerging trend in the global arena. The first thing that comes to our mind about shopping malls is that it is a big enclosed building housing a variety of shops or products. According to historical evidences shopping malls came into existence in the middle ages, though it was not called so.Shopping malls are the important part of the lives of people in today's world and a major source of entertainment that a common man desires.These shopping malls attract all but specifically the youth crowd in a larger percentage than other age categories towards them.

Nowadays, consumers desire a combination of comfort and suitability which these shopping malls provide. Many people just go to malls for window shopping to get updates on the latest products that have been launched or that has just arrived. There are many branded showrooms in these malls. Shopping malls have made shopping very convenient for people as they get almost everything under one same roof, and there is no extra expenditure of travel cost. These shopping malls are architecturally beautiful to attract more number of customers as they have a huge appetizing infrastructure. The inclusion of amenities(comport) like restaurants, multiplexes, and parking which attract more and more crowds to shopping malls and also considered family hangout zones.

There are two basic types called as the predictive and the descriptive task. Predictive task is used to predict missing or unavailable numerical data values.

Regression Analysis is generally used for prediction. Prediction can also be used for identification of distribution trends based on available data. Descriptive task is a process of drawing patterns and relationships amongst the data.

This paper uses classification model which comes under the predictive task. Classification is used to exactly predict the values. It classifies data based on the data set values.

A decision tree model is a photographic representation of data that is created based on the training set values. The nodes represent the attributes, branches representing the conditions that have been analysed and the leaf representing the result set.
Section I deals with the literature review related to this topic. Section II deals with the system model is presented referring to the main task of the paper. Section III is the performance analysis and results which describe the representation and analyzation of the performance using a data mining tool and how the results are interpreted. Section IV describes the conclusion derived from the interpreted results. Section V deals with the future work that can be extended further to predict the changing life style and trends in shopping that are being adapted due to modernization.

II. RELATED WORK

Background of the study of shopping mall is an organized system for Collection of different items and purchase of products. A shopping mall is typically, a shopping complex that is associated by many walkways as well it provides huge entertainment options to the target consumers. Shopping centre entertainment can be classified into three categories, namely special event entertainment, specialty entertainment and food entertainment

Customer Knowledge-Management Framework- this paper is done by *Charles Dennis, David Marsland and Tony Cockett* of *Brunel Business School, Brunel University studied about the* complex interdependencies between shoppers, retailers andowners, shopping centers are ideal for knowledge management study.

Prediction on shopping mall- this paper is done by Mohammed Ali. Shaik, S.Narasimha Rao of Aurora's Research and Technological Institute (ARTI), and Abdul Rahim Aurora's Scientific, Technological and Research Academy (ASTRA) *studied about the* to prediction of costumers in shopping malls.

A source for consumer behavior analysis- this paper is done by Abhijit Raorane1 & R.V.Kulkarni Department of computer science, Vivekanand College, Tarabai park Kolhapur *studied about the* on consumer purchasing behaviors have
Been presented and used in real problems.

The Effect of Shopping Mall Environment on Shopping Behaviour under a Model - this paper is done by Tooraj Sadeghi and Fereshteh Bijandi Department of Business Management, Islamic Azad University *studied about the* Based on psychological theory, shopping mall's environment influences behavioural habits/purposes of customers.

Consumers' Motivations to shop in Shopping Malls: this paper is done by Vipul Patel and Mahendra Sharma V.M.Patel Institute of Management, India studied about the Based up on a identified three utilitarian (i.e., convenient shopping, economic shopping and achievement shopping) and six hedonic shopping motivations.

III. SYSTEM MODEL

The classification model is used to segregate the target label based on certain conditions.

The various circumstances under which the prediction can be done is:

- New movie release
- Shopping
- Play area
- Food count
- Departmental area
- Toy store
- Adult games zones
- Beauty parlor/saloon
- Clicking pictures
- Parking

The attributes are rated on a scale basis and a survey is taken from a large set. While each attribute is taken on the whole of weight 5, people scale it accordingly from their level of perception.

RANGE	PERCEPTION
5	Always
4	Mostly
3	Often
2	Sometimes
1	Hardly
0	Never

Fig: 1

A formula can be manipulated whereby a marginal value is been fixed, and the label attribute can be predicted based on those record, thereby concluding that people focus on those categories in which the weight is above the marginal value.

FORMULA: (Formula used summation of attributes /total)

$$\frac{\sum (\text{ATTRIBUTES})}{\text{TOTAL OF ATTRIBUTES}}$$

ATTRIBUTES

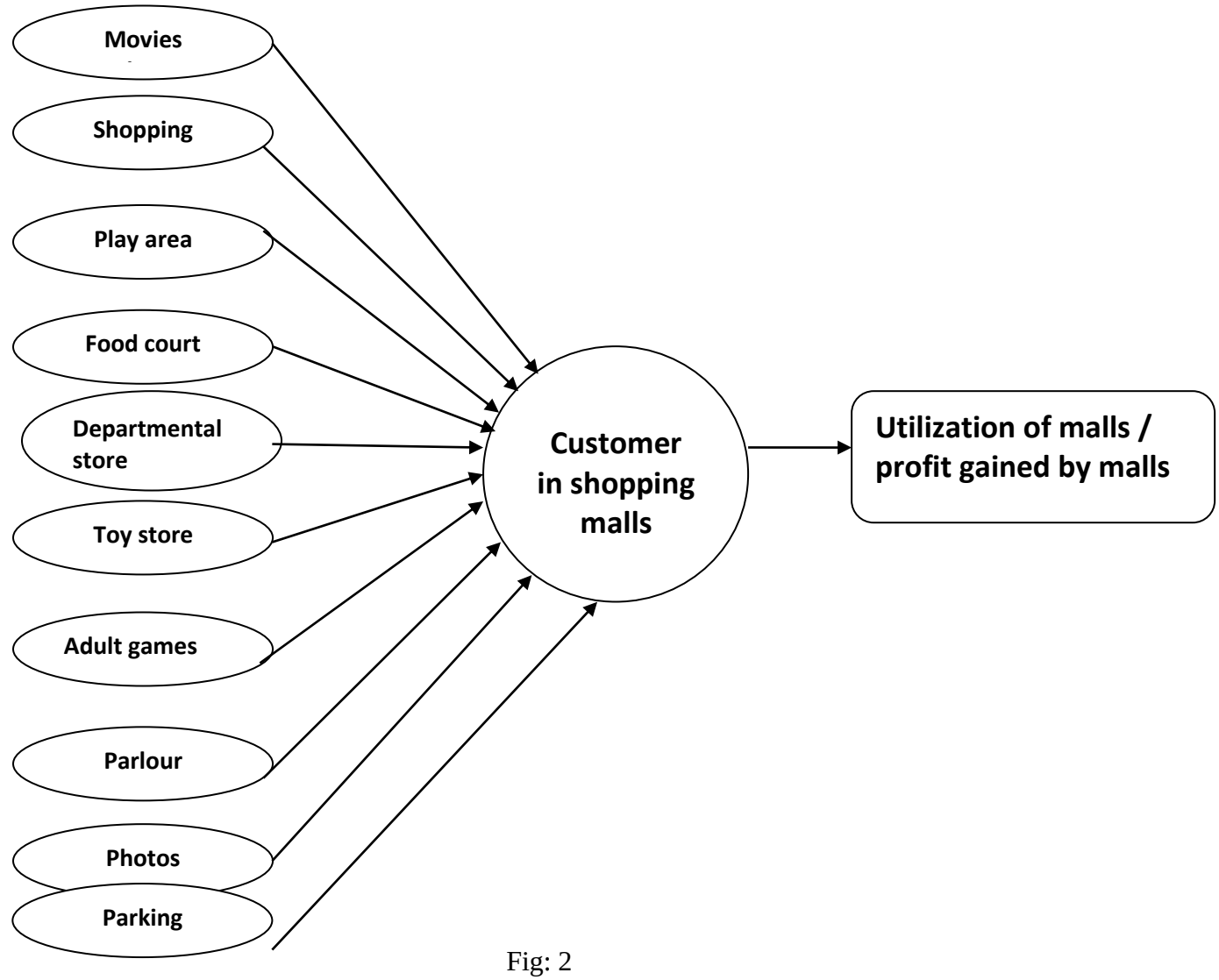


Fig: 2

IV. PERFORMANCE ANALYSIS AND RESULTS

The data provided is connected with the decision tree model.

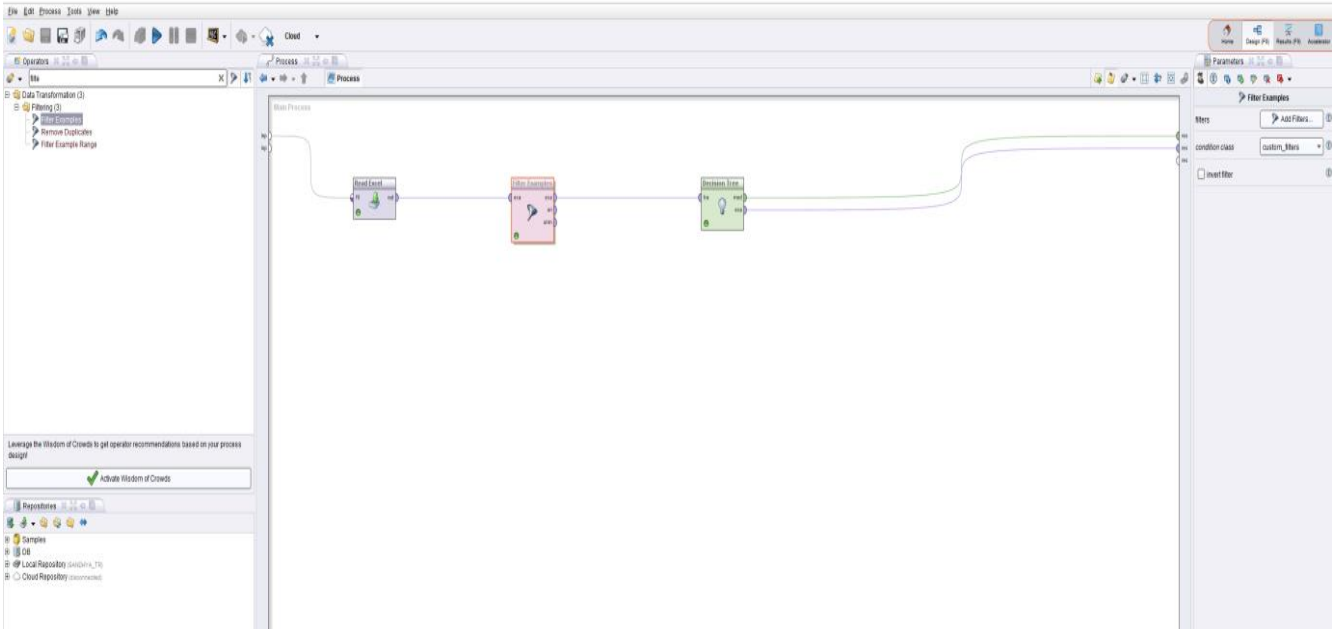


Fig: 3

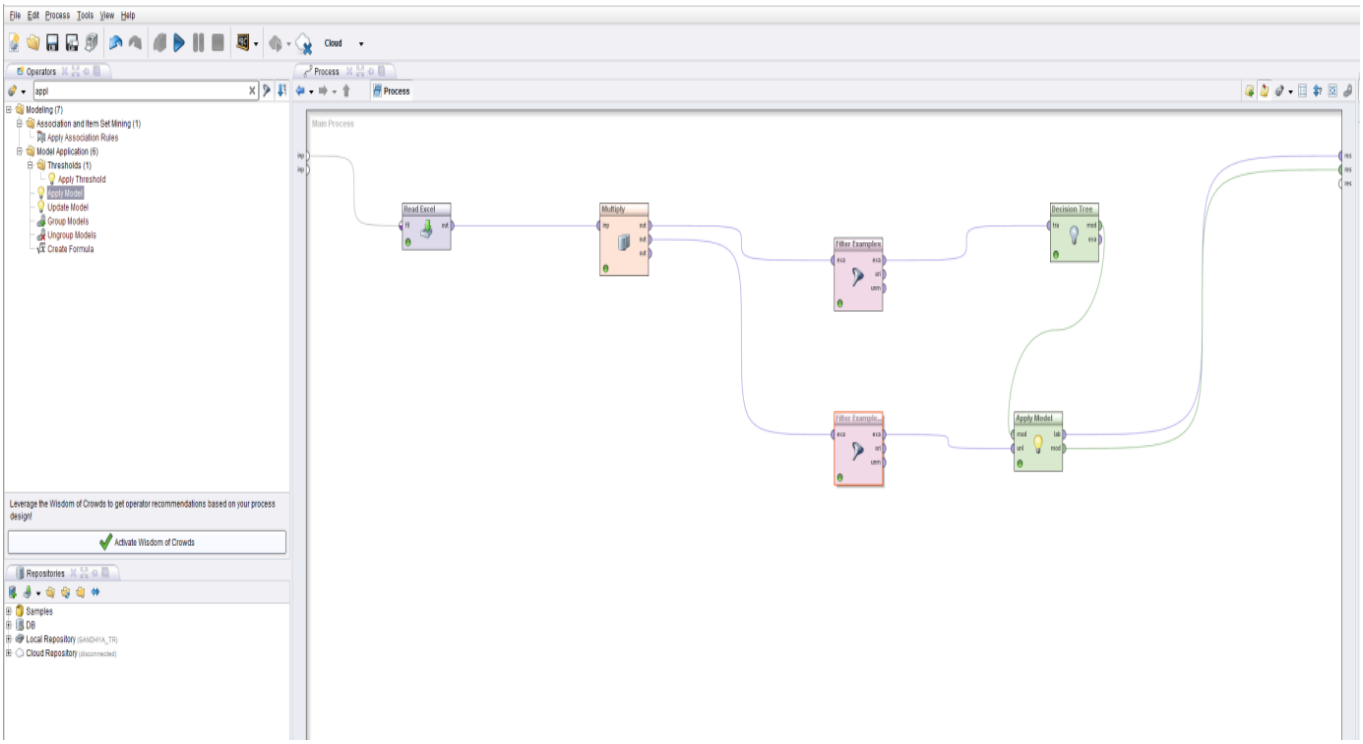
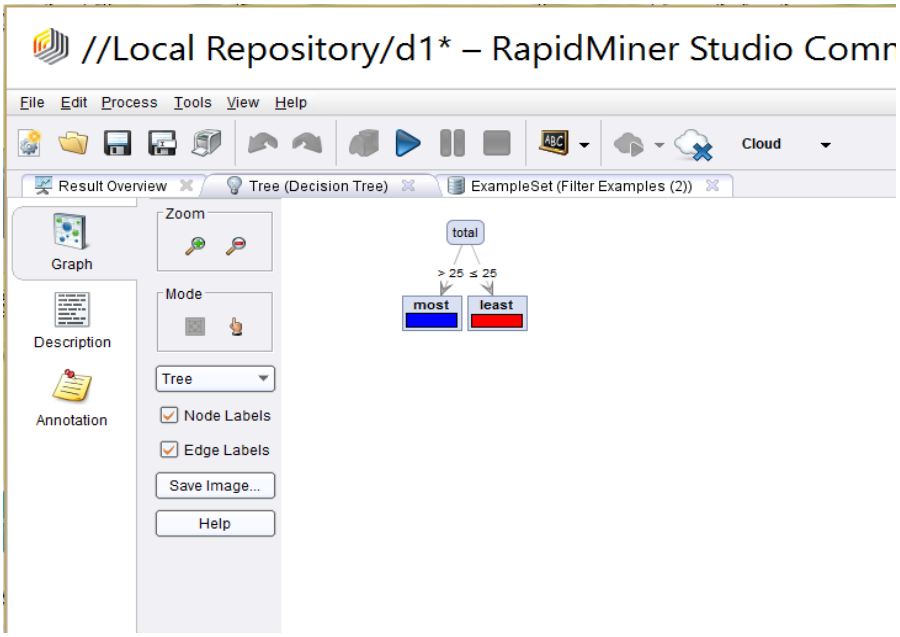


Fig: 4

Decision tree based on the data.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Cloud
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Tree (Decision Tree)
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Annotation
Zoom
Mode
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Node Labels
Edge Labels
Save Image...
Help
total
> 25 ≤ 25
most
least

Fig: 5

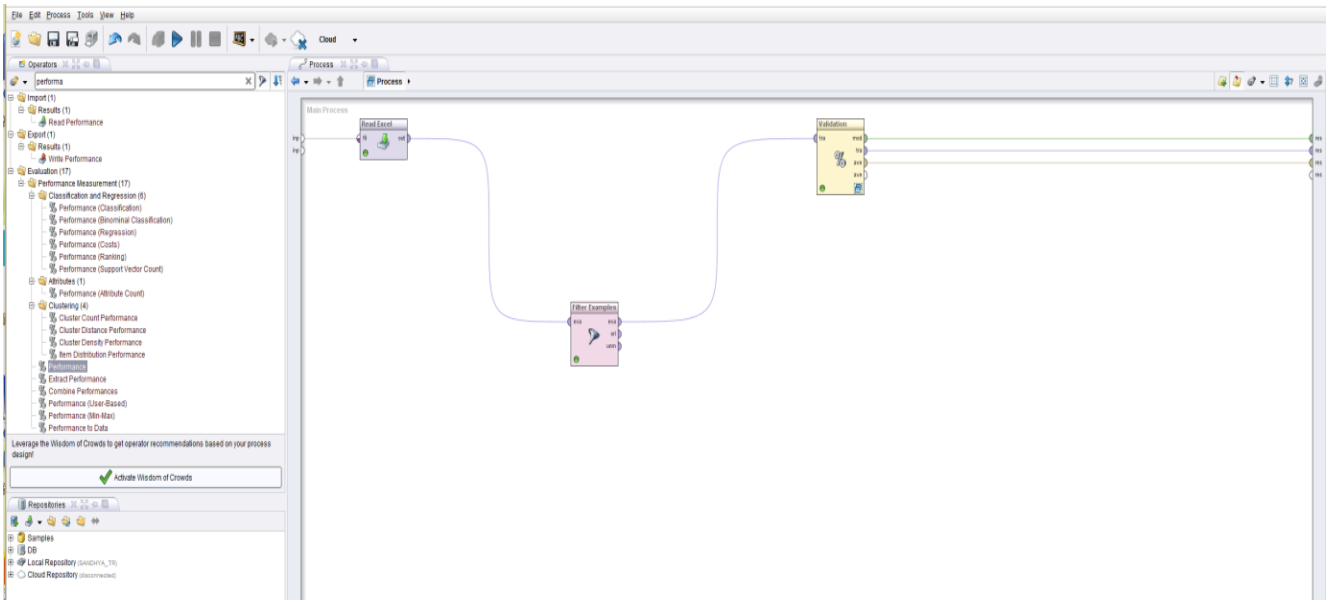

Fig: 6

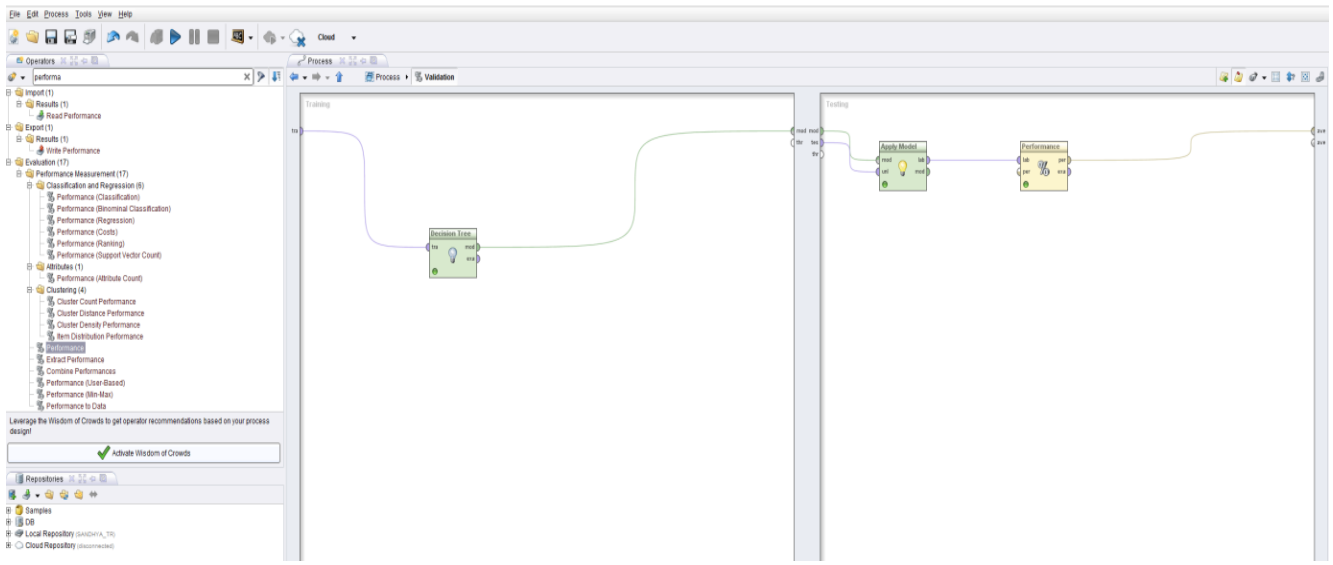

Fig: 7

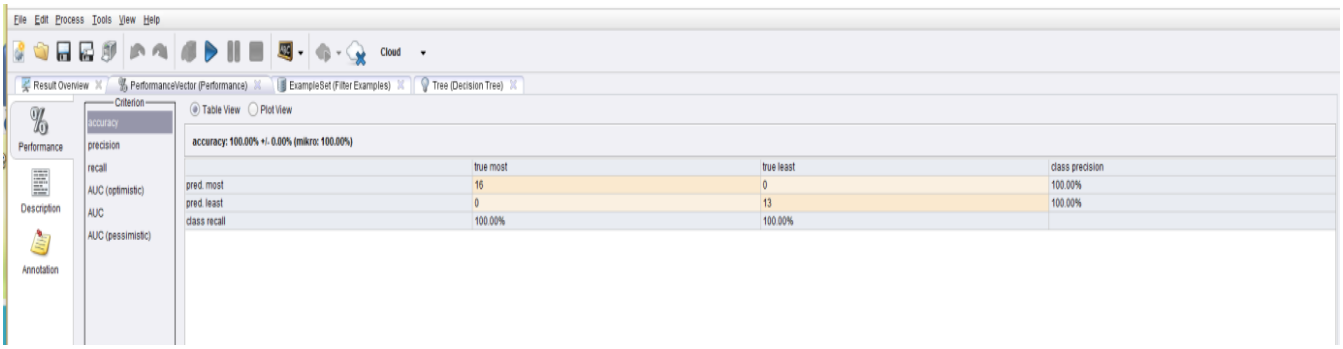

Fig: 8

If the calculated average value is above the marginal value, then the prediction is ‘always’ and if it is less than the marginal value, the prediction is ‘never’ i.e. if the predicted value is ‘always’ it means that the people use malls for that particular purpose always and if the predicted value is ‘never’ denotes that they very rarely use malls for that particular purpose.
Accuracy of this model was determined to be 98%.

V. CONCLUSION

This model finally helped clarify the different patterns & manners in which customers shop in malls and also predict the behavior of individual shoppers. The different attributes used for this prediction not only helped evaluate but also showed various profit gaining strategies & quantitatively divide different categories of customers in different environments of shopping malls instead of wasting time & money for travelling to different outlets for the same purpose. This concludes that shopping malls’ being a global arena and a centre of attraction in this generation is a comfortable, convenient & profitable way of shopping for customers.

VI. FUTURE WORK

This paper uses technique that concentrates in predicting the pattern of shopping adopted by individual shoppers and the future work here can be extended further to predict the changing life style and trends in shopping that are being adapted due to modernization.

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